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The article closes with some general observations, among which the following facts of general interest are brought out:

(1) The use of entomogenous fungi in combatting injurious insects can not be of any injury to man except as they may infect useful insects such as the silk-worm.

(2) No reliable means have yet been ascertained by which injurious insects can be combatted by *Entomophthoreæ.* The question is a more difficult one than has been supposed.—E. A. S.

MASSEE, GEORGE. *A Monograph of British Gastromycetes.* Annals of Botany, November, 1889, Vol. IV., No. XIII, pp. 1–103. Four double plates.

This monograph, which may well be used as a hand-book for collectors of British fungi, is also of interest to American students of this group.

The work contains a discussion of the group in general and of the families comprising it, which is much more readable than De Bary's description of the same as found in the translation of his Morphology and Biology of Fungi. There are also chapters on Affinities and Distribution. A table is added giving the entire list of genera, distinguishing the British ones and noting the entire number of species and numbers of British species.

Mr. Massee divides the *Gastromycetes* into the following families: *Hymenogastreæ*, *Sclerodermeæ*, *Nidularieæ*, *Podaxineæ*, *Lycoperdeæ*, and *Phalloideæ.* The first corresponds, as regards the genera included, almost exactly to Saccardo's descriptions of the same. He includes the genus *Sphanchnomyces* under *Hymenogaster*, and says that a specimen of *Pompholyx sapidum* found near Chichester is evidently a species of *Scleroderma.* He differs from Saccardo in considering the *Sclerodermeæ* as one of the primary divisions of the *Gastromycetes*, and includes in it the following genera: *Polygaster*, *Scleroderma*, *Polysaccum*, *Arachnion*, *Scoleciocarpus*, *Paurocotylis*, *Ciliciocarpus*, *Lycogalopsis*, *Glishroderma.* These are all included in Saccardo's sub-family *Sclerodermeæ* of the *Lycoperdeæ*, but do not comprise all of the genera that Saccardo assigns to the sub-family; the others are placed in the *Lycoperdeæ.*

Massee says that the *Sclerodermeæ* occupy an intermediate position between the *Hymenogastreæ* and *Lycoperdeæ*, differing from the former in not being subterranean and from the latter in the absence of the capillitium and the indehiscent peridium. The genera included in the *Nidularieæ* are the same as those of Saccardo's Sylloge.

In his table of genera he ranks the *Podaxineæ*, which Saccardo regards as a sub-family of the *Lycoperdeæ*, as a family of equal value with the latter. It contains no British genera, however. His *Lycoperdeæ*, therefore, include considerably fewer genera than Saccardo's family of the same name. He characterises it by the constant presence of a capillitium produced from the hyphæ of the trama or peridium and remaining mixed with the spores after the deliquesence of the tramal and hymenial elements. Winter's family *Tulastomei* is placed as a genus

(*Tulastoma*) under the *Lycoperdeæ.* Much attention is given in this, as in others of Mr. Massee's articles, to synonyms and references to literature, and a complete Bibliography is appended, besides the very full references in the description of species.

The plates are excellent, both from an artistic and a scientific point of view.—E. A. S.

WAGER, HAROLD W. T. *Observations on the Structure of the Nuclei in Peronospora parasitica, and on their behaviour during the formation of the Oospore.* Annals of Botany, November, 1889, pp. 127-146. One double plate.

The fact that even the general occurrence of nuclei in fungi has been and is disputed, and that only two observers have ever made any attempt to investigate the phenomena of karyokinesis, even where the presence of nuclei was unquestioned, renders this paper unusually interesting.

The best results were obtained by imbedding the material in paraffine and cutting ribbon sections with a Cambridge microtome. By means of this process, the details of which are given, nuclei were found and their division watched in every portion of the fungus.

In the hyphæ.—The nuclei are most numerous where the hyphæ appear to be completely full of protoplasm, and in well stained sections the chromatin can be seen to arrange itself into threads, which are arranged in the equatorial plane, and which finally separate into two groups, the divisions moving to the opposite poles of the nucleus. Neither the spindle nor the longitudinal splitting of the chromatic elements were observed.

In the oogonium and antheridium.—Large numbers of nuclei are present in both oogonia and antheridia; in the former they become arranged in a layer in the periplasm, and all, with those of the antheridium, pass simultaneously through the karyokinetic processes; two (or three?) of the nuclei of the oogonium then pass into the center, and a wall is formed, shutting out the periplasmic nuclei which rapidly divide into smaller ones. At the same time an antheridial tube is developed, into which some of the nuclei of the antheridium pass. Of these one probably passes into the oospore; the remainder seem to pass into the periplasm of the oogonium, when the antheridial tube becomes disorganized. The ripe oospore contains several nuclei, and its endo- and exo-spore are formed from the periplasm and nuclei contained in it.

In the gonidia.—The nuclei of the gonidia are larger than those of other portions of the fungus, and differ in structure. There are a large number in each spore, but neither their division nor their origin has been observed.—E. A. S.

WARD, H. MARSHALL. *Timber and Some of its Diseases.* 8mo., 295 pages. Macmillan & Co.

The author, in this little volume, although treating the subject in a somewhat popular way, will especially interest the readers of this